

CLAIMS

1. An acoustic wave switch comprising:
a substrate;
a mesa formed on the substrate, the mesa defining an acoustic wave cavity;
5 a driver generating an acoustic wave in the acoustic wave cavity wherein a touch on a touch surface of the acoustic wave cavity produces a detectable change in the acoustic wave in the cavity; and
a feedback mechanism to provide tactile and/or audible and/or visual feedback to a user that a switch has been actuated by a touch on
10 the touch surface.
2. An acoustic wave switch as recited in claim 1 wherein the feedback mechanism includes a member that overlies the touch surface of the acoustic wave cavity and is spaced therefrom in an unactuated position, the member moving into contact with the touch surface by a
5 force acting thereon to actuate the switch.
3. An acoustic wave switch as recited in claim 1 wherein the member includes a deformable dome.
4. An acoustic wave switch as recited in claim 3 wherein the dome has an acoustic wave absorber on a surface moved into contact with the touch surface of the acoustic wave cavity.
5. An acoustic wave switch as recited in claim 3 further including a sheet of acoustic wave absorbing material overlying the touch surface, the dome contacting the acoustic wave absorbing material to actuate the switch.

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5 6. An acoustic wave switch as recited in claim 2 wherein the member includes an acoustic wave absorber on a surface thereof overlying the touch surface and at least one magnet to hold the member in an unactuated position until a force acting on the member actuates the switch, and the magnet returning the member to an unactuated position when the force is removed.

7. An acoustic wave switch as recited in claim 6 wherein the member includes a rocker having a pivot with the absorber mounted on the rocker on one side of the pivot and the magnet mounted on the rocker on another side of the pivot.

5 8. An acoustic wave switch as recited in claim 6 wherein the member includes a plunger extending through an aperture in a metal plate spaced from the substrate, the absorber being mounted on a bottom surface of the plunger and the magnet being mounted on the plunger between the absorber and the metal plate.

5 9. An acoustic wave switch as recited in claim 1 wherein the feedback mechanism includes an electrically actuated member mounted on a back surface of the substrate, the member having a striker that is moved against the substrate to strike the substrate when the member is actuated in response to a detectable change in the acoustic wave indicating a touch on a touch surface.

10. An acoustic wave switch comprising:
a substrate;
a mesa formed on the substrate, the mesa defining an acoustic wave cavity;

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5 a transducer coupled to the mesa or a surface of the substrate
opposite the mesa to generate an acoustic wave in the cavity wherein a
touch on a touch surface of the substrate produces a detectable change in
the acoustic wave;

10 a feedback member overlying the touch surface and spaced
therefrom in an unactuated position and movable towards the touch
surface by a force acting thereon to actuate the switch by producing a
detectable change in the acoustic wave; and

 an acoustic wave absorber disposed between the feedback
member and the touch surface.

11. An acoustic wave switch as recited in claim 10 wherein
the feedback member includes a deformable dome.

12. An acoustic wave switch as recited in claim 11 wherein
the dome is a truncated dome.

13. An acoustic wave switch as recited in claim 10 wherein
the absorber is mounted on a surface of the feedback member facing the
touch surface.

14. An acoustic wave switch as recited in claim 10 wherein
the absorber overlies the substrate such that a touch by the feedback
member on an area of the absorber overlying the cavity produces a
detectable change in the acoustic wave.

15. An acoustic wave switch as recited in claim 10 further
including at least one magnet to hold the feedback member in an
unactuated position until a force acting on the member actuates the

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5 switch and the magnet returning the member to an unactuated position
when the force is removed.

16. An acoustic wave switch as recited in claim 10 wherein
the feedback member includes a rocker having a pivot with a magnet
mounted on the rocker on a first side of the pivot to hold the feedback
member in an unactuated position and the magnet returning the feedback
5 member to an unactuated position when the force is removed.

17. An acoustic wave switch as recited in claim 16 wherein
the absorber is mounted on the rocker on a second side of the pivot.

18. An acoustic wave switch as recited in claim 16 wherein
the feedback member includes a plunger extending through an aperture
in a metal plate spaced from the substrate, the absorber being mounted
on a bottom surface of the plunger and further including at least one
5 magnet mounted on the plunger between the absorber and the metal
plate to hold the feedback member in an unactuated position.

19. An acoustic wave switch comprising:
a substrate;
a mesa formed on the substrate, the mesa defining an acoustic
wave cavity;
5 a transducer coupled to the mesa or a surface of the substrate
opposite the mesa to generate an acoustic wave in the cavity wherein a
touch on a touch surface of the substrate produces a detectable change in
the acoustic wave;
a feedback member mounted on a backside of the substrate, the
10 feedback member being electrically actuated in response to a detectable
change in the acoustic wave indicating a touch to provide a tactile

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response felt by the user through the substrate and/or an audible response.

20. An acoustic wave switch as recited in claim 1 wherein the feedback member includes an electrically actuated member mounted on a back surface of the substrate, the member having a striker that is moved against the substrate to strike the substrate when the member is actuated in response to a detectable change in the acoustic wave indicating a touch on a touch surface.
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